Claims

[1] A demodulation apparatus for receiving signals by an adaptive modulation and coding method, and demodulating the signals, in an OFDMA based packet communication system, comprising:

a QAM demapper for performing a QAM (Quadrature Amplitude Modulation) demapping process to the received signals by a modulation method using the a maximum modulation ratio, and outputting data, until modulation methods for each sub-channels are analyzed;

a slot buffer for storing the data outputted from the QAM demapper for each slot;

a channel decoder for decoding the data stored in the slot buffer, analyzing modulation methods for each sub-channels and transferring the analyzed modulation methods to the QAM demapper; and reading valid data from the data stored in the slot buffer, based on the analyzed modulation methods for each sub-channels and demodulating the valid data, and outputting the demodulated data.

[2] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein

the channel decoder controls read enable signals for controlling the data output stored in the slot buffer, and reads the valid data from the slot buffer.

[3] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein

the channel decoder selectively outputs addresses being accessed to only valid data from among the data stored in the slot buffer, and reads the valid data from the slot buffer.

[4] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein the slot buffer comprises:

a first slot buffer for storing data outputted from the QAM demapper until the modulation methods for each sub-channels of the received signals are analyzed by the channel decoder; and

a second slot buffer for storing data outputted from the QAM demapper, once the modulation methods for each sub-channels of the received signals are analyzed by the channel decoder.

[5] The demodulation apparatus in the OFDMA based packet communication system of claim 4, wherein

the first slot buffer stores the data demapped by the modulation method using the maximum modulation ratio in the QAM demapper; and
the second slot buffer stores the data demapped by the modulation methods analyzed for each sub-channels in the QAM demapper.

[6] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein the channel decoder reads the MAP information in the former part of a frame among the symbol data stored in the slot buffer, and analyzes the modulation methods for each sub-channels.

[7] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein
the QAM demapper performs a demapping process to the received signals by the modulation methods for each sub-channels, and stores the output data in the slot buffer, once the modulation methods for each sub-channels are analyzed by the channel decoder.

[8] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein
in the case data are demodulated by the modulation method using the maximum modulation ratio, a constellation for part of the data are is identical with a constellation for the data demodulated by the modulation methods for each sub-channels.

[9] The demodulation apparatus in the OFDMA based packet communication system of claim 8, wherein the demodulation apparatus further comprisesing:
an FFT unit for performing FFT (Fast Fourier Transform) to the received signals and outputting the signals;
a re-ordering buffer for re-ordering the signals outputted from the FFT unit and storing the signals;
an equalizer for estimating channels using the signals stored in the re-ordering buffer 72 and performing equalization of the signals, and outputting the signals to the QAM demapper.

[10] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein
in the case the modulation method using the maximum modulation ratio is 64 QAM, and a data unit for storing in the slot buffer is 6 bits of data,; the valid data by the 16 QAM modulation method are former 4 bits of data from among the 6 bits of data.

[11] The demodulation apparatus in the OFDMA based packet communication system of claim 1, wherein
in the case the modulation method using the maximum modulation ratio is 64 QAM, and data unit for storing in the slot buffer is 6 bits of data,; the valid data by the QPSK modulation method are 2 bits of data in front of the 6 bits of data.

[12] A demodulation method for receiving signals by an adaptive modulation and coding method and demodulating the signals, in an OFDMA based packet communication system, comprising stages of:
a) performing a demapping process to the received signals by a modulation method using a maximum modulation ratio and storing the signals;
b) decoding the demapped and stored signals the data and analyzing the modulation methods for each of sub-channels; and
c) performing a demapping process on the received signals by the analyzed modulation methods for each sub-channels and demodulating the signals.

[13] The demodulation method in the OFDMA based packet communication system of claim 121, wherein
the signals are stored in stage a) until the modulation methods for each sub-channels are analyzed; only valid data from among the signals are read by the modulation methods for each sub-channels analyzed in stage b); and the valid data are demodulated.